NORTH DAKOTA
DEPARTMENT *of* HEALTH

RADIATION
FREQUENTLY ASKED QUESTIONS

What is radiation?
Radiation is a form of energy. It comes from manmade sources such as x-ray machines, from the sun and outer space, and from some radioactive materials such as uranium in soil.

How can I be exposed to radiation?
Small quantities of radioactive materials occur naturally in the air we breathe, the water we drink, the food we eat, and in our own bodies. Radiation that goes inside our bodies causes what we refer to as **internal** exposure. The exposure that is referred to as **external** comes from sources outside the body, such as radiation from sunlight and manmade and naturally occurring radioactive materials.

Radiation doses that people receive are measured in units called "rem" or "sievert." (One sievert is equal to 100 rem.) Scientists estimate that the average person in the United States receives a dose of about one-third of a rem per year. Eighty percent of typical human exposure comes from natural sources, and the remaining 20 percent comes from artificial radiation sources, primarily medical x-rays.

What are the health effects of exposure to radiation?
Radiation can affect the body in a number of ways, and the negative health consequences of exposure may not be seen for many years. These negative health effects can range from mild effects, such as skin reddening, to serious effects such as cancer and death, depending upon the amount of radiation absorbed by the body (the dose), the type of radiation, the route of exposure and the length of time a person is exposed. Exposure to very large doses of radiation may cause death within a few days or months. Exposure to lower doses of radiation may lead to an increased risk of developing cancer or other negative health effects.

How can I protect myself from radiation?
The three basic ways to reduce your exposure are through:

- **TIME:** Decrease the amount of time you spend near the source of radiation.
- **DISTANCE:** Increase your distance from a radiation source.
- **SHIELDING:** Increase the shielding between you and the radiation source. Shielding is anything that creates a barrier between people and the radiation source. Depending on the type of radiation, the shielding can range from something as thin as a plate of window glass or as thick as several feet of concrete. Being inside a building or a vehicle can provide shielding from some kinds of radiation.

What types of terrorist events might involve radiation?

- Possible terrorist events could involve introducing radioactive material into the food or water supply, using explosives (like dynamite) to scatter radioactive materials (called a

"dirty bomb"), bombing or destroying a nuclear facility, or exploding a small nuclear device.

- Although introducing radioactive material into the food or water supply most likely would cause great concern or fear, it probably would not cause much contamination or increase the danger of negative health effects.
- Although a dirty bomb could cause serious injuries from the explosion, it most likely would not have enough radioactive material in a form that would cause serious radiation sickness among large numbers of people. However, people who were exposed to radiation scattered by the bomb could have a greater risk of developing cancer later in life, depending upon their dose.
- A meltdown or explosion at a nuclear facility could cause a large amount of radioactive material to be released. People at the facility probably would be contaminated with radioactive material and possibly be injured if there was an explosion. Those people who received a large dose might develop acute radiation sickness. Immediate symptoms include nausea, vomiting and diarrhea. Other symptoms can develop including weight loss, loss of appetite, flu-like symptoms and bleeding. People in the surrounding area could be exposed or contaminated.
- Clearly, an exploded nuclear device could result in a lot of property damage. People would be killed or injured from the blast and might be contaminated by radioactive material. Many people could have symptoms of acute radiation sickness. After a nuclear explosion, radioactive fallout would extend over a large region far from the point of impact, potentially increasing people's risk of developing cancer over time.

For more information, call the North Dakota Department of Health at 701.328.2378.